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DISTRIBUTIONAL EFFECTS OF ECONOMIC GROWTH. REGIONAL CROSS-SECTION FOR RURAL INDIA

INTRODUCTION

The nature of relationship between income inequalities and economic growth has been the subject of research interest for a long time. In fact, there have been many attempts to arrive at some definite results and conclusions but they often proved to be debatable for the lack of adequate data, which could support the logical hypotheses. Furthermore, most of these studies failed to examine the relationship between economic growth and income inequalities in terms of its dynamics, i.e. considering the change of inequalities over time for the same sample.

The present article aims at making a contribution of this kind. It is focused on the relationship between the change in income inequalities in rural areas and the rates of growth in various sectors of the economy. The subject of this study is to examine the impact of economic growth on the change of income inequalities. In other words, an effort has been made to find out how inequalities change under different patterns of economic growth.

METHOD

The method adopted to the research is based on the analysis of increments and includes statistical test of relationship between the change of income inequalities over time (dependent variable represented by Gini coefficient, statewise) and:

(a) rate of growth of agricultural net income (ANI) and nonagricultural net income (NANI) respectively per rural and urban capita, statewise;
(b) initial levels of economic advancement (i.e. at the beginning of observation period) represented by respective levels of ANI and NANI per capita, statewise. These indicators should be surely weighted to avoid the misleading influence of marginal sectors of enclave character, which might have had high level of income per capita. The

weights are expressed as the shares of particular sectors in overall state income.

Both changes of Gini cofficients and the rates of growth are calculated from regression on time as the coefficient b, e.g.:

(1) $G=a+b_G T$;

where: G : Gini coefficient;
b_G : change of Gini over time;
T : time variable.

Levels of economic advancement may be calculated as coefficient a from regression on time respectively for ANI and NANI, e.g.:

(2) $\mathrm{ANI}=b_{\mathrm{ANI}}+a_{\mathrm{ANI}}T$;

where: ANI : agricultural net income per rural capita;
a_{ANI} : initial theoretical level of economic advancement in rural sector;
b_{ANI} : rate of growth of ANI per rural capita;
T : time variable.

Thus the model assumed for the investigation is as follows:

(3) $b_{\mathrm{G}}=\mathrm{f}(b_{\mathrm{ANI}}, b_{\mathrm{NANI}}, a_{\mathrm{W-ANI}}, a_{\mathrm{W-NANI}})$;

where: b_{G}, b_{ANI}, b_{NANI} as specified above;
$a_{\mathrm{W-ANI}}$, $a_{\mathrm{W-NANI}}$ represent initial theoretical levels of economic advancement in agricultural and non-agricultural sectors, both weighted.

Satistacfory solution of the model might actually enable to find out the answers to several essential questions:

— having known the actual level of income and planning the rate of sectoral growth, one could presume how income inequalities in agriculture would change;
— it could be helpful to define which sector influences agricultural incomes inequalities more and for what level of income this impact may increase or decline;
— minimalising the main function (3) one could define in what scenario of economic growth the decrease of income inequalities in agriculture is the biggest one.

DATA

Data on income inequalities originate from *National Sample Surveys* (NSS). Incomes are representanted by consumer expenditures, which — as assumed by NSS Organisation — may be considered as "good proxy for income, because large part of income, if not all, is spent for the basic consumer needs of household" (Sarvekshana 1981), Despite an obvious underestimation which must result from this assumption, particularly in case of

higher income strata, the NSS assumption is advantageous for the goals of present research because consumer expenditures certainly show less fluctuations over time than rural incomes. Besides, the *National Sample Survey* is practically the only source of data on incomes in India. The authors were in relatively advantageous situation due to the long period of observation, so the reliability of data being used to prove the main formula has increased. The period of observation covers the years 1957/58 to 1977/78, the latest available survey dealing with consumer expenditures.

Data on state net incomes originate from respective state yearbooks (constant prices 1960/61). Agricultural net incomes comprise agriculture, husbandry, fishing and forestry. Data were available for 14 Indian states. They are shown in Table 2 and are used to prove the main formula (3).

RESULTS

The results of multiple regression are shown in Table 1. Because of the slight differences in dependent variable, it includes standardized coefficients of regression, which are unsensitive to the scale of measurement of the predictor variable.

Ignoring for the time being the question of statistical significance, both standard and stepwise regression demonstrate that the concentration ratio has negative correlation with b_{NANI} and positive with b_{ANI}. It would manifest that the growth in non-agricultural sectors is more meanigful for the reduction of agricultural income inequalities. Furthermore, the results demonstrate that the growth in agriculture augments the concentration of agricultural incomes.

Besides, it seems that there is no correlation between the agricultural income inequalities and the initial level of weighted net income. Stepwise regression sustains this conclusion despite low fraction of explained variance. It may obviously concern only the given range of variance, in this case starting from Rs 57 per capita in rural West Bengal up to 738 Rs in urban West Bengal, which is still very low (aprox. US $ 25—370 annually in mid 50s). It should be stressed, however, that the correlation with $a_{\text{W-ANI}}$ is negative, i.e. the initial level of agricultural income per capita is higher, the decline of concentration ratio is bigger, which could eventually support the Kuznets' hypothesis of reverse U curve.

The results and conclusions should be interpreted with care, due to their low significance from the statistical point of view. Anyway, if one considers the degree of freedom (8), as you can notice in Table 1, the results seem to be reasonably good. The final results have been surely influenced by the considerable variance of the basic data.

Table 1

Results of model solution (t-values in parentheses)

Step	b_{ANI}	b_{NANI}	a_{W-ANI}	a_{W-NANI}	R SQR	Residual degree of freedom
			standard regresion			
	0.288 (.891)	−.344 (.774)	−.125 (.342)	0.008 (.021)	0.24	8
			step-wise regression			
step 1 variable entered: b_{NANI}	−.381* (1.365)				0.14	11
step 2 variable entered: b_{ANI}	.288 (1.028)	−.416* (1.484)			0.23	10
step 3 variable entered: a_{W-ANI}	.289 (0.987)	−.349 (1.010)	−.125 (0.364)		0.24	9

* — indicates significance at 20% level.

Table 2

Data tabulation (resulting from the solution of formula 1 and 2)

No	State	b_{Gini} ($x10^{-3}$)	b_{ANI}	b_{NANI}	a_{W-ANI}*	a_{W-NANI}*	Weights	
							ANI	NANI
1.	Andhra Pradesh	−2.093	0.237	7.783	133.694	209.687	0.64	0.36
2.	Assam	−3.920	0.163	18.662	77.732	645.950	0.55	0.45
3.	Gujarat	−1.384	1.360	14.680	209.708	635.750	0.50	0.50
4.	Karnataka	−2.035	1.389	18.605	122.193	114.007	0.66	0.34
5.	Kerala	0.795	−0.566	8.110	94.452	353.280	0.55	0.45
6.	Madhya Pradesh	−3.058	−2.613	6.069	118.863	279.144	0.59	0.41
7.	Maharashtra	−0.860	−0.421	20.006	91.455	382.462	0.44	0.56
8.	Orissa	−0.102	1.525	−25.022	81.236	678.704	0.59	0.41
9.	Punjab-Haryana	−2.653	5.320	31.925	148.512	196.653	0.63	0.37
10.	Rajastan	−2.289	−0.034	−30.800	75.187	672.492	0.44	0.56
11.	Tamil Nadu	−2.144	−2.350	3.309	124.785	329.156	0.51	0.49
12.	Uttar Pradesh	−1.353	0.304	−0.943	95.760	360.609	0.58	0.42
13.	West Bengal	1.241	3.617	−14.627	57.106	738.806	0.33	0.67

* Theorical initial levels of state income a_{ANI} and a_{NANI} (unweighted yet) were calculated for the year 1955/56 as time variable in regression sets (2) was assumed as equal to zero for this year.

CONCLUSION

The authors have attempted to explore the impact of decomposed rate of economic growth on the transformation of agricultural incomes distribution. The model solution revealed that the correlation between the change of agricultural incomes inequalities and the growth outside agriculture is negative and more significant than in case of growth in agriculture itself.

Furthermore, the empirical test shows that at least at low level of income per capita, the conflict between the equity in agriculture and growth outside agriculture does not seem to exist. Extending the model beyond the limits of variance of this sample, it could be argued, that at least at low and reasonably low level of development, the distribution of income may not necessarily get worse with the acceleration of economic growth in terms of inter-sectoral relations, as considered in this study.

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